

# NEW MODEL 620



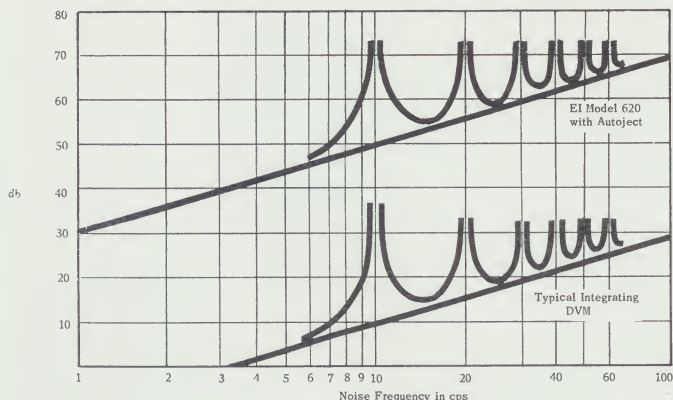


# HIGH PERFORMANCE IN A **NEW** LOW COST PACKAGE

The Model 620 Digital Measuring Instrument is a low cost, portable, simple to operate digital voltmeter-ratiometer with features normally found only in units costing two to three times as much. All circuitry, including logic, is completely solid state.

This guarded, differential input instrument is designed to provide an automatic, high speed, accurate measurement of DC voltages and DC/DC ratios in the presence of high noise levels. The design highlight of the Model 620 is high speed noise rejection, designated AUTOJECT.\* This exclusive AUTOJECT principle of noise cancellation is combined with the integration technique of voltage measurement. AUTOJECT, in effect, synchronizes the sample period with the noise component such that the noise integrates to zero irrespective of its phase or frequency.

**AUTOMATIC NOISE REJECTION INDEPENDENT OF FREQUENCY, THROUGH INTEGRATION**



AUTOJECT, in combination with the guarded differential input, provides a minimum of 140db common mode rejection and a minimum normal mode rejection of 60db at any noise frequency above 30 cps. This is accomplished in a fixed sample time of 100 msec. Now for the first time, long sample durations of one to three seconds, previously necessary in order to obtain such high noise rejection at low frequencies, have been eliminated.

The Model 620 measures the unknown analog voltage, converts it into digital form, displays the value on its five digit readout and simultaneously presents it in 10 line decimal electrical output format for automatic recording systems.

The flexibility of the Model 620 allows the selection of features as necessary to fit your present requirements or budget.

## 5 DIGIT READOUT

Shown is the actual color and contrast of display!

A polarized light filter is utilized for providing extremely high contrast red numerals against a solid black background for maximum definition under extremely high ambient light conditions.

Long life neon bulbs are used with new, exclusive, built in illumination condensers for maximum brilliancy and even illumination of each bar segment.

All numerals are on a single plane which provides extremely wide angle viewing without parallax.

Automatic self check of all bar segments is provided during the encoding cycle. All decades are matrixed to display the figure eight (8) which indicates the proper operation of all line segments. Additional function indicators are built in for AC, Resistance and Preamplifier.

## POLARITY and RANGE INDICATION

Signal polarity is automatically indicated and is the true integral value over the entire sample period and is therefore not subject to error. Decimal point indicates correct range both in DC and Ratio operation.

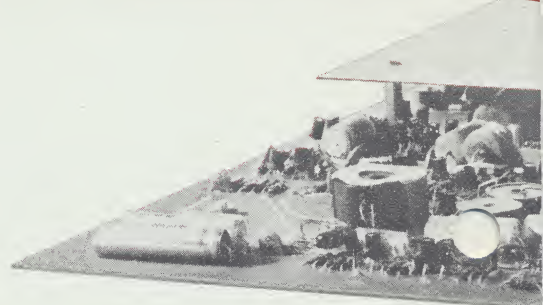
## REMOTE CONTROL

Allows external programming of function, range and encode.

## ELECTRICAL OUTPUTS

Provides 10 line decimal information for automatic printer or recorder operation.

## REAR INPUTS



\*Patent pending





#### INPUT SECTION

Guarded, differential and completely isolated from chassis and electrical outputs.

#### EXTERNAL REFERENCE

Differential and guarded with high input impedance for minimum external reference loading. Reference common and signal common need not be the same.

#### SINGLE FUNCTION CONTROL

Ratio - choice of external reference voltage range.  
DC - manual or automatic selection of ranges.  
Remote - remote selection of function and range.

#### SINGLE ENCODE CONTROL

Power, variable sample rate, single encode and hold. When power switch is actuated, meter is automatically placed in the maximum sample rate position.

#### CALIBRATION CONTROLS

Centrally located for maximum efficiency.

#### RATIO and/or AUTO RANGING

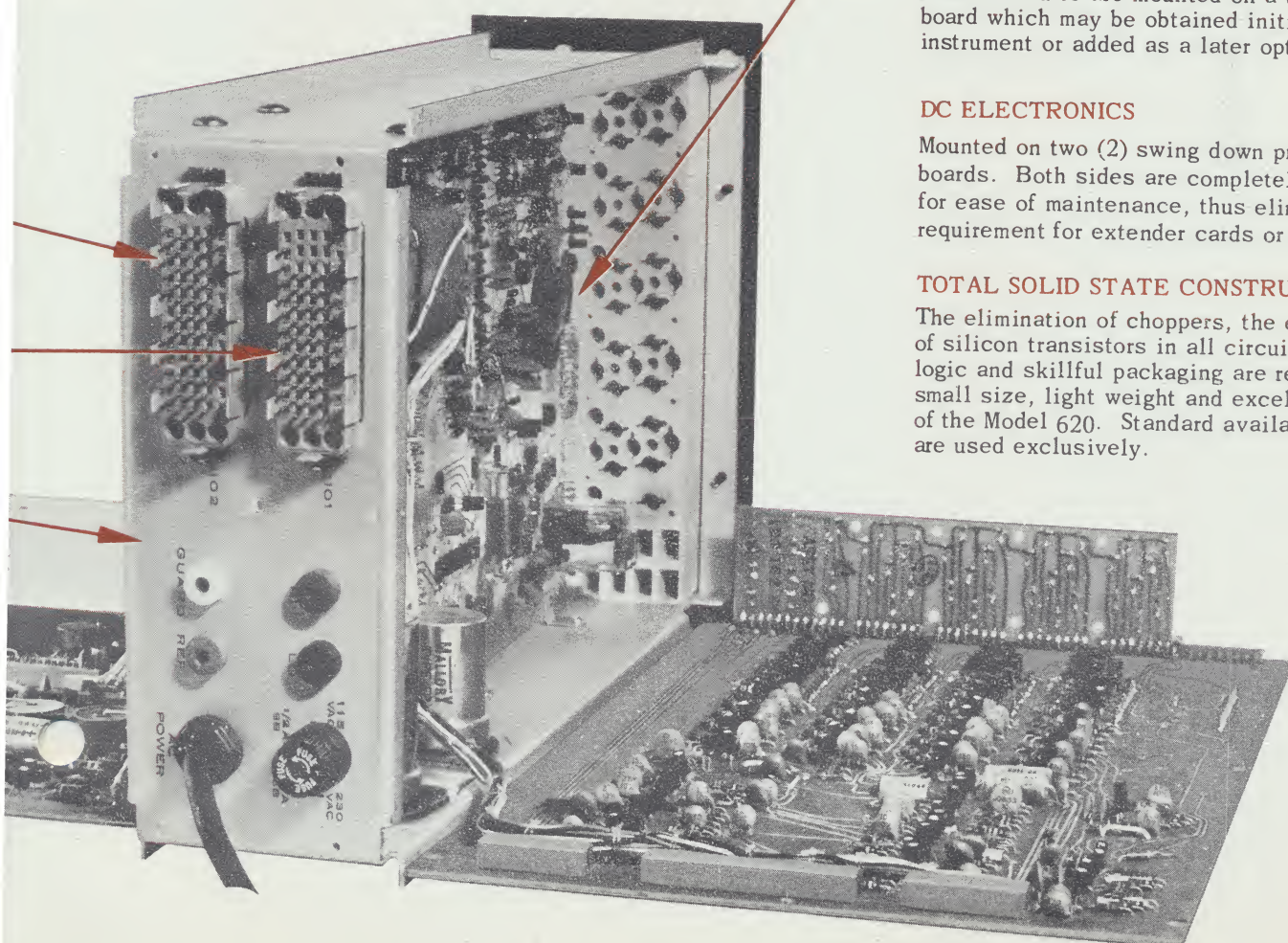
These circuits are mounted on a separate plug-in board which may be obtained initially with the instrument or added as a later option.

#### DC ELECTRONICS

Mounted on two (2) swing down printed circuit boards. Both sides are completely accessible for ease of maintenance, thus eliminating the requirement for extender cards or cables.

#### TOTAL SOLID STATE CONSTRUCTION

The elimination of choppers, the extensive use of silicon transistors in all circuits including logic and skillful packaging are responsible for small size, light weight and excellent reliability of the Model 620. Standard available components are used exclusively.





## Specifications

DISPLAY: 5 digits

DC RANGES: full scale

$\pm 9.999$  plus overrange to  $\pm 12.000$  volts

$\pm 99.99$  plus overrange to  $\pm 120.00$  volts

$\pm 750.0$  volts

RANGING:

manual - front panel control

automatic - 10 msec per range (20 msec worst case) meter will up range at 118% of F.S. and down range at 10.5% of F.S. assuring no loss of resolution near the range transfer points.

remote - external contact closures

RATIO RANGE: 1:0.0000 to 1:1.2000

RATIO RANGING:

single fixed range with choice of 10 or 100 volt ( $\pm 20\%$ ) external reference

SENSITIVITY:

1 millivolt on basic range, DC and Ratio

RESOLUTION: .01% of F.S.

ACCURACY:

$\pm .01\%$  of reading  $\pm .01\%$  of F.S. at ASA reference conditions

$\pm .05\%$  of reading  $\pm .01\%$  of F.S. at ASA rated conditions (6 months)

REFERENCE:

internal Zener regulated supply

INPUT IMPEDANCE:

DC and ratio, 10 volt range - potentiometric (greater than 1,000 megohms)

DC and ratio, 100 volt range - 10 megohms

DC only, 750 volt range - 10 megohms.

This represents a fixed, constant impedance throughout the entire encode cycle.

EXTERNAL REFERENCE INPUT IMPEDANCE:

potentiometric (greater than 1,000 megohms) to 10 volt reference

10 megohms to 100 volt reference

POLARITY: automatic polarity indication

COMMON MODE REJECTION: 140db at 60cps

maximum common mode voltage, 500 volts peak with 1K ohm source unbalance

## Ordering Information

OPTIONS:

620 - DC manual ranging \$ 995.00

620-1 - DC and Ratio \$1220.00

620-2 - DC and autorange \$1130.00

620-12 - DC, Ratio and autorange \$1385.00

AUTOJECT (normal mode and superimposed noise): 60db minimum rejection from 30 cps upwards, increasing at 20db per decade regardless of noise frequency with no degradation of encoding time.

SAMPLE TIME: 100 milliseconds (aperture time)  
Maximum - 4 readings per second

ELECTRICAL OUTPUTS:

10 line decimal outputs: ten outputs for each decade, corresponding to the numbers 0 - 9 plus decimal point and polarity indication.

10 line decimal levels: 0 to + 2 volts = true (1)  
+ 10 volts = false (0)

maximum load current: from 0 to 2 volts  
50  $\mu$ a. at + 10 volts

encode complete (print command):

levels - + 12 volts = true

0 volts = false

risetime - 1  $\mu$ sec. maximum

maximum load current: 4ma at + 10 volts  
100  $\mu$ a. at + 1 volt

REMOTE CONTROL:

Ranging - contact closure or solid state switch closure

Function - contact closure or solid state switch closure

Encode - negative going pulse of 12 volts in amplitude maximum of 1  $\mu$ sec. rise time and minimum duration of 5 msec.

OPERATING AMBIENT TEMPERATURE:

10°C to 40°C

POWER REQUIREMENTS:

105 - 125 or 210 - 250 volts AC, 50 to 60 cps.  
30 watts at 115 volts AC

WEIGHT: 15 pounds

SIZE: 4-1/4 x 8-1/2 x 15-1/2 (portable case)

## Additional Features

BUILT IN METER PROTECTION prevents instrument damage on any range.

INSTRUMENT STAND quickly converts into a convenient carrying handle for instant portability. Handsome scuff proof vinyl covered case adds distinctive looks and prevents marring of bench or desk tops.

ADDITIONAL MEASURING CAPABILITY

AC, resistance and preamplifier plug-in may be added by using the basic 620 instrument in conjunction with an accessory rack module. The 620 occupies half of the rack while the plug-in module occupies the other half. Thus all functions DC, Ratio, AC, Resistance and Preamplifier can be provided in one 19 x 5 1/4 inch package.

DATA HANDLING SYSTEMS

# Honeywell

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NOTE - PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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# COMPARE

## The HITACHI 505 Analog Computer is better than its U. S. counterpart on nine key specs. And it costs 20% less.

The Hitachi 505 Analog Computer will soon begin a nationwide demonstration tour so that scientists and engineers can personally compare and evaluate the design, the features and the economic and performance advantages of the Hitachi unit. In the meantime, get a head start on your buying decision by carefully reviewing the chart below.

### COMPARISON OF TWO LEADING DESK-TOP ANALOG COMPUTERS.

	HITACHI 505	EAI TR-48*
Date Designed	1965	1961
Computing Voltage Level	$\pm 100$ volts	$\pm 10$ volts
Expansion Capability	120 Amplifiers	58 Amplifiers
Amplifier Chopper	Solid State, FET Stabilized	Electromechanical
Digital Voltmeter	All Silicon, 5 Digit + Sign, Readout storage, DC, ratio and autorange	4½ Digit Readout
Solution Display Scope	Electronic Grid provides + 0.1% accuracy	Mechanically-Generated Scale
Patchboard	All-aluminum shielded	Plastic, unshielded
Function Generator	Exclusive Two-variable Function Generator	Not available
Digital Logic	Integrated Digital Mode Control Unit, \$3000	Separate Unit DES-30, \$5000-10,000
Price	505-32 (32 Amplifiers) \$16,543	TR-48-2 (32 Amplifiers) \$21,197

\*All specifications and prices from manufacturer's published literature.

Write or call today for complete technical data and prices and to learn when the demonstration tour will visit your area. Ask for Data File H505-A.



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